

Notice of Allowability

Application No.

10/645,269

Examiner

Jason Mitchell

Applicant(s)

STEVENS, CAMERON

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to an application filed 8/21/06.
2. ☒ The allowed claim(s) is/are 1-13, 15-16, 18-19, 21-38, 40-41, 43-44, 46-53 no renumbered as 1-48.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 12/7/06
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
BIOLOGY CENTER 2100

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Ms. Nancy Gamburd, registration no. 38147, on 12/7/06.

3. **The application has been amended as follows:**

Amendment to the specification

Amend the paragraph starting at pg. 1, line 14 as follows

This application is related to a Paul L. Master et al., U. S. Patent Application Serial No. 10/384,486, entitled "Adaptive Integrated Circuitry With Heterogeneous And Reconfigurable Matrices Of Diverse And Adaptive Computational Units Having Fixed, Application Specific Computational Elements", filed March 7, 2003, commonly assigned to QuickSilver Technology, Inc., and incorporated by reference herein, with priority claimed for all commonly disclosed subject matter (the "related application"), which is a continuation-in-part of Paul L. Master et al., U. S. Patent Application Serial No. 09/1815,122 now patent no. 6,836,839, entitled "Adaptive Integrated Circuitry With

Art Unit: 2193

Heterogeneous And Reconfigurable Matrices Of Diverse And Adaptive Computational Units Having Fixed, Application Specific Computational Elements", filed March 22, 2001, commonly assigned to QuickSilver Technology, Inc.

Amend the paragraph starting at pg. 56, line 16 as follows:

The system, methods and programs of the present invention may be embodied in any number of forms, such as within a computer, within a workstation, within a computer network, within an adaptive computing device such as an ACE 100, or within any other form of computing or other system used to create or contain source code. Such source code further may be compiled into some form of instructions or object code (including assembly language instructions or configuration information for adaptive computing).

The source code of the present invention may be embodied as any type of software, such as C++, C#, Java, or any other type of programming language which performs the functionality discussed above, including the preferred SilverC embodiment. The source code of the present invention and any resulting bit file (object code or configuration bit sequence) may be embodied within any tangible storage medium, such as within a memory or storage device for use by a computer, a workstation, any other machine-readable medium or form, or any other storage form or medium for use in a computing system. Such storage medium, memory or other storage devices may be any type of memory device, memory integrated circuit ("IC"), or memory portion of an integrated circuit (such as the resident memory within a processor IC), including without limitation

Art Unit: 2193

RAM, FLASH, DRAM, SRAM, MRAM, FeRAM, ROM, EPROM or E²PROM, or any other type of memory, storage medium, or data storage apparatus or circuit, depending upon the selected embodiment. For example, without limitation, a tangible medium storing computer readable software, or other machine-readable medium, may include a floppy disk, a CDROM, a CD-RW, a magnetic hard drive, an optical drive, or a quantum computing storage medium or device, ~~a transmitted electromagnetic signal (e.g., used in internet downloading), or any other type of data storage apparatus or medium.~~

Amendment to the claims

1. A method for programming an adaptive computing device, the adaptive computing device having a plurality of heterogeneous nodes coupled through a matrix interconnect network, the method comprising:
 - creating a first program construct having a correspondence to a selected node of the plurality of heterogeneous nodes;
 - creating a second program construct having a correspondence to an executable task of the selected node;
 - creating a third program construct having a correspondence to at least one input port coupling the selected node to the matrix interconnect network for input data to be consumed by the executable task; and

Art Unit: 2193

creating a fourth program construct having a correspondence to at least one output port coupling the selected node to the matrix interconnect network for output data to be produced by the executable task;

providing for synchronization of production of output data with consumption of input data by:

creating a fifth program construct corresponding to a data producing task notifying a data consuming task of the creation of output data; and

creating a sixth program construct corresponding to a data consuming task notifying a data producing task of the consumption of input data;

providing for commencement of the executable task by creating a seventh program construct having a correspondence to a task manager of the selected node; wherein the seventh program construct is a ready routine and has a form comprising:

ready (*pipeName*, *numberOfElements*);

wherein *pipeName* is a placeholder for a unique identifier of either the third program construct or the fourth program construct and *numberOfElements* is a placeholder for an amount of data which is sufficient for commencement of the executable task;

compiling the created program constructs; and

executing the compiled program constructs to program the adaptive computing device.

14. (Canceled).

15. The method of claim 1[[4]] wherein either the data producing task is executable on a first node of the plurality of heterogeneous nodes and the data consuming task is executable on a second node of the plurality of heterogeneous nodes or both the data producing task and the data consuming task are executable on a same node of the plurality of heterogeneous nodes.

16. The method of claim 1[[4]] wherein the fifth program construct is a notify routine and has a form comprising:

notify (*outpipeName*, *numberOfElementsWritten*);

wherein *outpipeName* is a placeholder for a first unique identifier of the fourth program construct and *numberOfElementsWritten* is a placeholder for an amount of output data produced; and wherein the sixth program construct is a release routine and has a form comprising:

release (*inpipeName*, *numberOfElementsRead*);

wherein *inpipeName* is a placeholder for a second unique identifier of the third program construct and *numberOfElementsRead* is a placeholder for an amount of input data consumed.

17. (Canceled)

18. The method of claim 1[[7]] wherein the seventh program construct further corresponds to an initialization of a producer count table of the task manager.

19. The method of claim 1[[7]] wherein the seventh program construct further corresponds to an initialization of a consumer count table of the task manager.

20. (Canceled).

21-25. (Original)

26. A tangible medium storing computer readable software for programming an adaptive computing device, the adaptive computing device having a plurality of heterogeneous nodes coupled through a matrix interconnect network, the tangible medium storing computer readable software comprising:

a first program construct having a correspondence to a selected node of the plurality of heterogeneous nodes;

a second program construct having a correspondence to an executable task of the selected node;

a third program construct having a correspondence to at least one input port coupling the selected node to the matrix interconnect network for input data to be consumed by the executable task; and

a fourth program construct having a correspondence to at least one output port coupling the selected node to the matrix interconnect network for output data to be produced by the executable task;

a fifth program construct corresponding to a data producing task notifying a data consuming task of the creation of output data;

a sixth program construct corresponding to a data consuming task notifying a data producing task of the consumption of input data;

wherein the fifth program construct and the sixth program construct provide for synchronization of production of output data with consumption of input data;

a seventh program construct having a correspondence to a task manager of the selected node to provide for commencement of the executable task;

wherein the seventh program construct is a ready routine and has a form comprising:

ready (*pipeName*, *numberOfElements*);

wherein *pipeName* is a placeholder for a unique identifier of either the third program construct or the fourth program construct and *numberOfElements* is a placeholder for an amount of data which is sufficient for commencement of the executable task; and

wherein the program constructs are compiled and executed to program the adaptive computing device.

Art Unit: 2193

27-38. (Original)

39. (Canceled)

40. The tangible medium storing computer readable software of claim 26[[39]] wherein either the data producing task is executable on a first node of the plurality of heterogeneous nodes and the data consuming task is executable on a second node of the plurality of heterogeneous nodes or both the data producing task and the data consuming task are executable on a same node of the plurality of heterogeneous nodes.

41. The tangible medium storing computer readable software of claim 26[[39]] wherein the fifth program construct is a notify routine and has a form comprising:

notify (*outpipeName*, *numberOfElementsWritten*) ;

wherein *outpipeName* is a placeholder for a first unique identifier of the fourth program construct and *numberOfElementsWritten* is a placeholder for an amount of output data produced; and wherein the sixth program construct is a release routine and has a form comprising:

release (*inpipeName*, *numberOfElementsRead*) ;

wherein *inpipeName* is a placeholder for a second unique identifier of the third program construct and *numberOfElementsRead* is a placeholder for an amount of input data consumed.

42. (Canceled)

43. The tangible medium storing computer readable software of claim 26[[42]] wherein the seventh program construct further corresponds to an initialization of a producer count table of the task manager.

44. The tangible medium storing computer readable software of claim 26[[42]] wherein the seventh program construct further corresponds to an initialization of a consumer count table of the task manager.

45. (Canceled)

46-50. (Original)

51. A system, having a processor, for programming an adaptive computing device, the adaptive computing device having a plurality of heterogeneous nodes coupled through a matrix interconnect network, the system comprising:

means for defining a first program construct having a correspondence to a selected node of the plurality of heterogeneous nodes;

means for defining a second program construct having a correspondence to an executable task of the selected node, the second program construct having at least one

Art Unit: 2193

firing condition capable of determining a commencement of the executable task of the selected node;

means for defining a third program construct having a correspondence to at least one input port coupling the selected node to the matrix interconnect network for input data to be consumed by the executable task;

means for defining a fourth program construct having a correspondence to at least one output port coupling the selected node to the matrix interconnect network for output data to be produced by the executable task;

means for defining a fifth program construct having a correspondence to a notification of creation of output data, and means for a sixth program construct having a correspondence to a notification of consumption of input data; wherein the fifth program construct and the sixth program construct provide for synchronization of production of output data with consumption of input data;

means for defining a seventh program construct having a correspondence to a task manager of the selected node to provide for commencement of the executable task, wherein the means for the seventh program construct further has correspondence to an initialization of a producer count table of the task manager or a consumer count table of the task manager; and

means for defining an eighth program construct linking the fourth program construct to the third program construct, the eighth program construct corresponding to a selected configuration of the matrix interconnection network providing a communication path from a selected output port to a selected input port

means for compiling the defined program constructs; and

means for executing the compiled program constructs to program the adaptive computing device.

52. The system of claim 51, further comprising:

means for defining a ninth program construct to instantiate a program construct of a plurality of program constructs, the plurality of program constructs comprising at least the first program construct, the second program construct, the third program construct, the fourth program construct, and the eighth program construct.

53. (Original)

The following is an examiner's statement of reasons for allowance:

The closest prior art ("IEEE Standard Verilog Hardware Description Language" and "The VHDL Cookbook") alone or in combination do not disclose a ready routine program construct with parameters identifying a pipe and an indicating an amount of data which is sufficient for commencement of an executable task.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

Art Unit: 2193

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Mitchell whose telephone number is (571) 272-3728. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Jason Mitchell
12/7/06


MENG-AN T. AN
SUPERVISORY PATENT EXAMINER
BIOLOGY CENTER 2106